

REMARKS

Favorable reconsideration of this application, as presently amended and in light of the following discussion, is respectfully requested.

Claims 1-7 and 9-17 are currently pending. Claims 1, 4, 5, 9, and 16 have been amended; and Claim 8 has been cancelled without prejudice by the present amendment. The changes to the claims are supported by the originally filed specification and do not add new matter.

In the outstanding Office Action, the specification was objected to as containing various informalities; Claim 9 was objected to as containing an informality; Claim 4 was rejected under 35 U.S.C. § 112, first paragraph regarding the terms “matched filter” and “ring- average” filter; Claim 16 was rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter; Claims 1, 2, 4, 9, 10, 13, 14, 16, and 17 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,141,437 to Xu et al. (hereinafter “the ‘437 patent”); Claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘437 patent in view of U.S. Patent No. 6,754,380 to Suzuki et al. (hereinafter “the ‘380 patent”); Claims 5-7 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘437 patent in view of U.S. Patent Application Publication No. 2002/0141627 to Romsdahl et al. (hereinafter “the ‘627 application”); Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘437 patent in view of U.S. Patent Application Publication No. 2002/0172403 to Doi et al. (hereinafter “the ‘403 application”); Claim 15 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the ‘437 patent in view of U.S. Patent Application Publication No. 2003/0095696 to Reeves et al. (hereinafter “the ‘696 application”); and Claim 8 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form.

Applicants wish to thank the Examiner for the interview granted Applicants' representative on July 6, 2007, at which time the outstanding rejection of the claims was discussed. In particular, the Examiner indicated that Claim 1 would likely be allowed if amended to incorporate the limitations of Claim 8, but not those of intervening Claim 5. However, the Examiner indicated that further consideration and/or search would be required.

Applicants respectfully submit that the objection to the specification at paragraph 17 is rendered moot by the present amendment to that paragraph. However, Applicants respectfully traverse the objection to the specification at paragraphs 14, 16, and 18 regarding the use of the word "the" before "at least." In particular, Applicants respectfully submit that the term "the at least one respective morphological feature value" refers to that term recited in paragraph 13. Moreover, it is unclear to Applicants why the Examiner requests amendment to these paragraphs in the specification since these are not claims. Moreover, Applicants respectfully traverse the objection to the paragraph regarding federally sponsored research, which was added in the Preliminary Amendment filed December 15, 2005. First, Applicants note that this paragraph is already before the Summary of the Invention, as requested by the Office Action. Moreover, Applicants note that M.P.E.P. §608.01(a) indicates that the statement regarding federally sponsored research should be placed after the Title of the Invention, but before the Background of the Invention. Accordingly, for the reasons stated above, Applicants believe that the objections to the specification have been overcome.

Applicants respectfully submit that the objection to Claim 9 is rendered moot by the present amendment to Claim 9. Claim 9 has been amended to address the objection noted in the outstanding Office Action.

Applicants respectfully submit that the rejection of Claim 4 under 35 U.S.C. § 112, first paragraph, is rendered moot by the present amendment to Claim 4. Claim 4 has been amended to no longer recite a matched filter or a ring-average filter.

Applicants respectfully submit that the rejection of Claim 16 under 35 U.S.C. § 101 is rendered moot by the present amendment to that claim. Claim 16 has been amended to be directed to a computer program product embedded on the computer-readable medium, which is statutory.

Amended Claim 1 is directed to a method for detecting at least one nodule in a medical image of a subject, comprising: (1) identifying, in the medical image, an anatomical region corresponding to at least a portion of an organ of interest; (2) filtering the medical image to obtain a difference image; (3) detecting, in the difference image, a first plurality of nodule candidates within the anatomical region; (4) calculating respective nodule feature values of the first plurality of nodule candidates based on image pixel values of at least one of the medical image and the difference image; (5) removing false positive nodule candidates from the first plurality of nodule candidates based on the respective nodule feature values to obtain a second plurality of nodule candidates; and (6) determining the at least one nodule by classifying each of the second plurality of nodule candidates as a nodule or a non-nodule based on at least one of the image pixel values and the respective nodule feature values. Further, Claim 1 has been amended to incorporate the limitations recited in Claim 8. In particular, amended Claim 1 recites that the detecting step includes determining a respective center pixel having a maximum pixel value within a respective nodule region of each nodule candidate in the first plurality of nodule candidates; calculating, for a first respective subregion that includes the respective center pixel within each respective nodule region, at least one first morphological image feature, the first respective subregion being defined as those pixels having a pixel value above a first pixel threshold, but less than the maximum

pixel value; calculating, for a second respective subregion that includes said respective center pixel within each respective nodule region, at least one second morphological image feature, said second respective subregion defined as those pixels having a pixel value above a second pixel threshold, but less than said maximum pixel value; and determining said respective nodule region of each nodule candidate based on respective differences between the at least one first morphological image feature and the at least one second morphological image feature. The changes to Claim 1 are supported by the originally filed specification and do not add new matter.

The '437 patent is directed to a computer aided diagnosis method for the automated detection of lung nodules in a digital chest image. In particular, as shown in Figure 3, the '437 patent discloses that a difference image is obtained from an original chest image; and candidate nodules identified based on thresholding the nodules are differentiated from false positives through a rule-based test and/or an artificial neural network to generate detected nodules.

However, Applicants respectfully submit that the '437 patent fails to disclose the steps of determining a respective center pixel having a maximum pixel value within a respective nodule region of each nodule candidate in the first plurality of nodule candidates; and calculating, for a first respective subregion that includes the respective center pixel within each respective nodule region, at least one morphological image feature, the first respective subregion defined as those pixels having a pixel value above a first pixel threshold, but less than the maximum pixel value, as recited in amended Claim 1. In this regard, Applicants note that amended Claim 1 recites the limitations recited in Claim 8, which was indicated as allowable. Thus, as apparently admitted by the outstanding Office Action, the '437 patent fails to disclose the limitations added to amended Claim 1. Accordingly, for the

reasons stated above, Applicants respectfully submit that the rejection of Claim 1 is rendered moot by the present amendment to that claim.

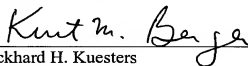
Regarding the rejection of dependent Claims 3, 5-7, 11, 12, and 15 under 35 U.S.C. § 103, Applicants respectfully submit that the '380 patent, the '627 application, the '403 application, and the '696 application fail to remedy the deficiencies of the '437 patent, as discussed above. Accordingly, Applicants respectfully submit that the rejection of the above-noted dependent claims is rendered moot by the present amendment to Claim 1.

Thus, it is respectfully submitted that amended Claim 1 (and all associated dependent claims) patentably defines over any proper combination of the '437 patent, the '380 patent, the '627 application, the '403 application, and the '696 application.

Consequently, in view of the present amendment and in light of the above discussion, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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